## REMARKS

***Status of Claims***

Claims 1-18 and 20-33 are present in the application at this time. Of these, claims 1, 21-24, and 31-33 are currently amended, and claims 2-18, 20 and 25-30 remain in their original or previously presented form. In addition, claim 19 has been canceled as the feature to which it was directed has now been incorporated in claim 1 as amended.

***Rejection of Claims under 35 U.S.C. 112***

Claims 21-24 and 31-33 have been amended to overcome this rejection. In particular connection with claim 21, it is respectfully noted that a gradient method is a standard and well-known computer algorithm. If the Examiner is unfamiliar with this, he is respectfully referred to the Wikipedia discussion on this subject.

For the record, however, applicants strenuously object to the Examiner's failure to examine these claims on their merits. Section 2173.06 of the M.P.E.P. makes it quite clear that where:

> the degree of uncertainty is not great, and where the claim is subject to more than one interpretation and at least one interpretation would render the claim unpatentable over the prior art, an appropriate course of action would be for the examiner to enter two rejections: (A) a rejection based on indefiniteness under 35 U.S.C. 112, second paragraph; and (B) a rejection over the prior art based on the interpretation of the claims which renders the prior art applicable.

It is respectfully submitted that with very little difficulty, the Examiner could have formulated a reasonable interpretation of these claims which would have permitted examination relative to the prior art applied to the other claims. As a consequence, if the Examiner adheres to some or all of the other rejections in the outstanding Office Action, and makes the next action final, applicants will have had only one examination on the merits of claims 21-24 and 31-33. It is therefore respectfully submitted that the next action should not be made final in any event.

***Rejection of Claims under 35 U.S.C. 101***

Preliminarily, it is respectfully submitted that the applicability of this rejection is not understood. At the bottom of page 3 of the Office Action, the Examiner applies the 35 U.S.C.

101 rejection to claim 35. There is no claim 35 pending in this application, nor has there ever been a claim 35. Then, at the top of page 4, the Examiner applies the rejection to claim 1. In view of this ambiguity, for purposes of response, the 35 U.S.C. 101 rejection will be treated as applicable only to claim 1.

On the basis of the foregoing, claim 1 has been amended to tie the processing to a particular machine. It is respectfully submitted that such amendment overcomes the rejection.

***Rejection of Claims under 35 U.S.C. 102 and 103***

Although the rejection is explicitly stated to be applicable to claim 1 (see top of page 1) claims 1, 3-9, 11, 14-19, 21-24, and 28-33 appear to stand rejected under 35 U.S.C. 102 or alternatively, under 35 U.S.C. 103, as anticipated by, or unpatentable over DeGraff U.S. patent 5,678,368 (DeGraff). This rejection is respectfully traversed.

Claims 2, 10, 12, 20, and 25 stand rejected under 35 U.S.C. 103, as unpatentable over DeGraff in view of Schneider, Jr. U.S. patent 5,394,325 (Schneider). This rejection is also respectfully traversed.

All of the rejected claims are directly or indirectly dependent on claim 1, the patentability of which will accordingly be addressed first.

By way of background, DeGraff is concerned with, and describes a method for selecting a shortest/fastest route in a discrete space, i.e. a "grid" where there is a given set of points to pass through, and a given set of segments (roads) that together make up the possible routes. The lengths/costs of routes are sums of costs of these edges (factored by the given weights).

In contrast, the invention as described in claim 1 is concerned with determining a path between two points in physical space, not constrained by a limited number of permissible paths or path segments such as DeGraff's map in a discrete space: In the physical space with which the invention is concerned, there are an infinite number of points, and the space in continuous and not discrete. As a consequence, finding a minimal-cost path between a start point and an end point theoretically requires evaluation of an infinite number of possible routes to pass through. Obviously, it is impossible to check all such paths one by one as in the discrete space. The method of claim 1 describes a practical alternative to such an impossible task.

The invention as described in claim 1 differs from DeGraff in another important respect as well. DeGraff begins with a pre-established database including path lengths and costs as defined by the constraining map, and describes a mechanism for altering the lengths/costs of segments using weights so that the original database of lengths/costs is adjusted. The search method for selecting the multiple relevant routes (176) before applying the weight adjustments is not described. The reference

patent describes a method for selecting the best route from a limited number of predefined routes using the weighted adjustments.

Claim 1 describes a search method involving practical estimations, which permits identifying the most promising routes to investigate first, and ultimately, to find the best of these, of the infinitely many possible routes in a physical space.

In summary, DeGraff does not address problems over physical space, and is not a search method. Instead, it is a way of improving the selection of results of an undisclosed search method over a discrete space. DeGraff does not disclose a search method, and does not address the problem of speeding the calculation time required to identify a path using estimations, or in any other way.

With the foregoing in mind, claim 1 has been amended to more clearly highlight the distinctions over DeGraff. Specifically, claim 1 recites a method of finding a path from a start point to a target point in multi-dimensional space. To highlight this, the body of the claim recites that "said path is not constrained by predefined path segments". That alone distinguishes claim 1 from DeGraff, in which the path *is* constrained by predefined path segments, as specified by the underlying map.

Claim 1 further recites that the method comprises:

> (a) determining a plurality of points in a physical space, including a start point and an target point,
>
> (b) computing, using a programmed general purpose computer and a cost function, for said points an accumulated path cost from the start point to a point; representing a minimal cost path from the start point to the point with respect to an optimization criterion;
>
> (c) computing, using said computer, for at least some of said points an estimated-cost-to-target from a point to the target point,
>
> wherein selection of the points for said estimated-cost-to-target computation is according to a pre-established criterion; and
>
> (d) after computing said costs, determining, using said computer, at least one of a minimal path or a minimal path cost of a path from the start point to the target point in the physical space, wherein the determination is based on said accumulated path costs. . .

From the background discussion above, it should be clear that these recited features describe a method of obtaining the best path by selecting only certain ones of the infinite number of possible paths for evaluation, instead of what would be a fruitless attempt to evaluate all paths. These features are not disclosed by DeGraff, which does evaluate all possible paths.

While it is recognized that a claim must be given the broadest reasonable interpretation for purposes of examination, it is respectfully submitted that the Examiner has gone well past the point of reasonable interpretation of claim 1, even in its previous form. He has essentially done the same with respect to DeGraff, stretching the meaning of what is disclosed in the reference to fit it around the elements recited in claim 1. With the highlighting amendments, there is even no reasonable way for the claim to be read on DeGraff.

For all the above reasons, it is respectfully submitted that claim 1 is allowable, whether considered under 35 U.S.C. 102 or 103.

Claims 2-33 are all directly or indirectly dependent on claim 1, and are respectfully submitted to be allowable for the reasons stated above. In addition, these claims each recite features, which, when considered in combination with the features of claim 1, are not disclosed, taught or suggested in the references.

***Allowability of Claims 13, 26, and 27***

Preliminarily, it is respectfully submitted that the Office Action is ambiguous in respect to these claims. In the Office Action Summary, the subject claims are stated to be objected to (see item 7), and no rejection appears to have been applied to them. They are, in fact, not mentioned at all in the Detailed Action.

For purposes of this response, it is assumed that the claims in question are objected to for their dependency on rejected parent claim 1. In view of the amendments to claim 1, and the foregoing remarks, claims 13, 26, and 27 are being retained in dependent form pending further consideration of claim 1 by the Examiner.

In view of the foregoing, applicants respectfully submit that the application is in order for allowance. A notice thereof is respectfully awaited.

Respectfully submitted,

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